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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/015,093	12/11/2001	Laurence W. Davies	26998-241838	7676
25764	7590	06/03/2004	EXAMINER	
FAEGRE & BENSON LLP 2200 WELLS FARGO CENTER 90 SOUTH 7TH STREET MINNEAPOLIS, MN 55402				YAO, SAMCHUAN CUA
		ART UNIT		PAPER NUMBER
		1733		

DATE MAILED: 06/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/015,093	DAVIES ET AL.
	Examiner Sam Chuan C. Yao	Art Unit 1733

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) Responsive to communication(s) filed on 22 March 2004.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) Claim(s) 1-60 is/are pending in the application.
  - 4a) Of the above claim(s) 50-58 and 60 is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-49 and 59 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Objections*

1. Claims 21-29 are objected to because of the following informalities: replace "permeably" recited in the claims with --permeable--. Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-49 and 59 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is indefinite, because it is unclear whether the recited longitudinally oriented rovings are components to a resultant reinforcing structure. If so, why are the oriented rovings not attached/bonded to a first reinforcing fibers and/or a permeable transport web of the resultant reinforcing structure? If not, what is the relationship between the recited longitudinally oriented rovings and a resultant reinforcing structure? It should be emphasized that the presently recited claims is directed to making a reinforcing structure.

***Claim Rejections - 35 USC § 102/103***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-15, 18-31, 34-36, and 59 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Rau et al (US 4,752,513).

With respect to claims 1-3, 14, 20, and 59, Rau discloses a process of making a pultruded composite, the process comprises:

- a) orienting an array of continuous strands (70) along an axial direction of a pultrusion die;
- b) providing a pair of permeable reinforcing structures, each comprising an underlying fiber (taken to be staple fibers) mat (62) and a plurality of overlapping continuous strand layers (4-7; reinforcing fibers), each strand layer being deposited transversely from the axial direction, wherein the underlying fiber mat and the strand layers are simultaneously perforated and bonded/entangled together by a needling operation, thereby forming a permeable reinforcing structure (64);
- c) impregnating the oriented continuous strands and the reinforcing structures by immersing each of them into a resin bath;
- d) folding each of the reinforcing structures to generally conform with a profile of the pultrusion die;
- e) feeding the oriented continuous strand into the pultrusion die;
- f) disposing and combining the oriented continuous strands between the folded pair of reinforcing structures in the pultrusion die;
- g) curing the resin the pultrusion die to form a pultruded composite; and,
- h) pulling the pultruded composite from the pultrusion die (col. 1 lines 32-37; col. 3 lines 4-68; col. 5 line 44 to col. 6 line 63). Although not expressly disclosed, since the transversely deposited strands comprises several layers as compared to a single fiber mat, the transversely deposited

strand layers must inherently comprise “*at least 40% [50%] of a volume of materials comprising the reinforcing structure*” (terms inserted).

Note further: Where ... the claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes, the PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product. **Whether the rejection is based on “inherency” under 35 USC § 102, on prima facie obviousness” under 35 USC § 103, jointly or alternatively, the burden of proof is the same, and its fairness is evidenced by the PTO’s inability to manufacture products or to obtain and compare prior art products.”** In re Best, 562 F2d 1252, 1255, 195 USPQ 430, 433-4 (CCPA 1977).

In any event, absent any showing of unexpected benefit, it is taken to be well within the purview in the art to determine a suitable relative volume between a fiber mat and transversely deposited strand layers in forming a reinforcing structure of Rau et al. It is worthnoting that, Rau also teaches using a scrim surface mat (col. 3 lines 37-58).

With respect to claims 4-5, since Rau et al is not restrictive to a particular fiber dimension in forming a fiber mat as evidence from the following passage: “*In producing mats of glass fibers, the fiber size can range widely ...*” (col. 3 lines 27-36); and since the recited fiber dimension is conventional in the art of making a fiber mat; these claims would have been obvious in the art.

With respect to claims 6-7, since a fiber mat having the recited weight basis is well known in the art, these claims would have been obvious in the art.

With respect to claims 8-12 and 15, see column 3 lines 50-52. It is a common practice in the art to use bicomponent fibers, each having reinforcing/loading core and thermo-binding shell such that, the difference in glass transition or softening temperature is significantly different so that, the reinforcing/loading core are not adversely affected during a thermo-activation of the thermo-binding shell. Moreover, polymeric fibers having the recited glass transition temperatures are well known in the art.

Furthermore, as the thermo-binding fibers are melted, the fiber mat must inherently be thermally bonded to the transversely deposited strands. For these reasons, these claims would have been obvious in the art.

With respect to claim 13, although not explicitly disclosed, the reinforcing structure of Rau et al has substantially in-plane mechanical and direction stability, because a reinforcing fiber mat is not only needled to a transversely overlapping layers of continuous strand, but they are also stitched together.

With respect to claim 18-19, see column 4 lines 11-27. The recited latex binders in claim 19 are taken to be conventional in the art.

With respect to claims 21-29, the recited permeability (depends significantly on a number of needles per unit area), stiffness, thickness, and tensile strength are all taken to be well within the purview of choice in the art. One in the art would have determined, by routine experimentation, a workable fiber mat characteristic for its intended application.

With respect to claims 30-31, see column 3 lines 1-8 and column 5 lines 44-53.

With respect to claims 34-36, see column 5 lines 54-67, especially US patent 4,340,406 cited by Rau et al.

8. Claims 16-17 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rau et al (US 4,752,513) as applied to claim 1 above, and further in view of Smith (US 3,761,345).

It would have been obvious in the art to replace a reinforcing structure taught by Rau et al with a reinforcing structure taught by Smith, because:

- a) Rau et al discloses providing a reinforcing structure having characteristics that would form a pultruded article which has "*a substantially uniform reinforcement throughout and tensile properties in all direction that are adequate for the intended use*" (col. 1 lines 44-65); and,
- b) Smith teaches forming "*an improved reinforcement structure*" having a similar configuration as Rau (i.e. fiber mat and transversely deposited layers of strands are needled together), accordingly, the reinforcing structure has "*improved multidirectional strength characteristics*" and "*improved conformability and better resin absorption characteristics*", so that a resultant reinforced article has "*improved strength*" (col. 2 lines 3-15). It directly follows that, in view that, the reinforcement structure of Smith comprises a fiber mat and overlapping oriented layers of strands which are **stitched together** using unstretched polyester filaments after

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being needled (col. 6 lines 25-42; col. 10 lines 9-60; figure 15), claims 16-17 would have been obvious in the art.

With respect to claim 38, see figures 1 and 10-11 of the Smith patent, for example.

9. Claims 32-33, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rau et al (US 4,752,513) as applied to claim 1 above, and further in view of Dana et al (US 5,908,689).

With respect to claims 32-33, the recited organosilane agent is a conventional coupling agent in the art. It is a common practice to apply an organosilane coupling agent to a fiberglass reinforcing structure as exemplified in the teachings of Dana et al (col. 6 lines 41-55).

With respect to claim 37, since Dana et al teaches forming a needled reinforcing structure comprising an alternating layers of fiber mat ply and a plurality of overlapping continuous strand plies which are deposited transversely from the axial direction, wherein the reinforcing structure can be used in a pultrusion process, this claim would have been obvious in the art.

10. Claims 1-17, 18-31, 34-36, 38, and 59 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Smith (US 3,761,345). The discussion of the Smith patent set forth in numbered paragraph 6.

Although not expressly disclosed, since the transversely deposited strands comprises several layers as compared to a single fiber mat, the transversely deposited strand layers must inherently comprise “*at least 40% [50%] of a volume of materials comprising the reinforcing structure*” (terms inserted). In any event, absent any showing of unexpected benefit, it is taken to be well within the purview in the art to determine a suitable relative volume between a fiber mat and transversely deposited strand layers in forming a reinforcing structure of Smith.

11. Claims 1-49 and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beer et al (US 5,910,458) in view of Vane (5,055,242).

Beer et al discloses a reinforcing composite suitable for use in a pultrusion, molding, filament winding, etc. operation, the composite comprises a primary unidirectional glass fiber strand layer, and a secondary randomly oriented staple fiber mat layer; wherein the two layers are needled together (col. 1 lines 17-22; col. 2 lines 16-46; col. 19 lines 12-18; figure 1).

Beer et al does not teach providing reinforcing glass strands arrange in a transverse direction wherein the reinforcing glass strands comprises at least 40% of the volume of a resultant composite. However, it would have been obvious to one having ordinary skill in the art, from a combined consideration of the applied teachings, to replace an axially oriented reinforcing glass fiber strand layer taught by Beer et al with a multidirectional reinforcing glass strand such as the one taught by Vane, because Vane discloses a continuously formed multi-directional

reinforcing glass strand suitable for use in a pultrusion, molding, winding/wrapping, etc. operations, the reinforcing glass strand comprises an axially oriented reinforcing glass fiber layer and a plurality of transversely oriented glass fibers layers, wherein the resultant reinforcing glass strand has a *"consistent quality and strength"* (abstract; col. 2 lines 5-25). The incentive on the part of one having ordinary skill in the art for making this modification would have simply been to obtain the self-evident advantages forming a uniformly constructed reinforcing composite which has a multidirectional strength characteristics (i.e. axial orientation as well as multiple and different transverse orientations) instead of unidirectional strength characteristics. It directly follows that, since there are several layers of transversely oriented glass strands as compared to a single fiber mat layer and a single axially oriented strand layer, as illustrated in figure 1, these transversely oriented glass strand layers must comprise at least 40% or 50% of the total volume of a modified reinforcing composite taught by Beer.

With respect to claims 3-38, these claims would have been obvious in the art for substantially the same line of reasonings set forth in numbered paragraphs 5-7 above.

With respect to claims 39-49, see figure 1 of the Vane patent.

#### ***Double Patenting***

12. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11

F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

13. Claims 1-49 and 59 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-54 and 64 of copending Application No. 10/015.092. Although the conflicting claims are not identical, they are not patentably distinct from each other because the presently recited claims embrace or read on the claims recited in Application '092.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Response to Arguments***

14. Applicant's arguments filed on 03-22-04 have been fully considered but they are not persuasive.

On page 13, Counsel argues that, the mats of Rau are constructed from randomly oriented fibers. To support Counsel's assertion, Counsel cited a passage in column 2 lines 10-14, where it states "... *Both mats are characterized by having the fibers randomly distributed throughout the mat.*" This cited passage does not change fact that, a strand mat taught by Rau et al is clearly formed by moving strands 4,5,6 and 7 "*back and forth across the conveyor*

*surface transverse to the path of travel”* (col. 5 lines 54-63; figure 5). As for the passage cited by Counsel, it could be possible that, it is referring to entangled fibers resulting from a needling operation illustrated in figure 5. In that figure, it shows transversely oriented strands overlaying a fiber mat are needled together. It should be strongly emphasized that, however, after performing the needling operation, the overall orientation of the strands is not expected to change substantially. In other words, the strands are expected to substantially retain their overall transverse orientation relative to a machine direction.

As for Counsel’s argument on the same page that, the “*permeable transport web provides sufficient structural integrity that the generally transverse reinforcing fibers maintain their transverse orientation even when subjected to the pulling forces encountered during pultrusion.*”. It is respectfully submitted that, Counsel’s argument is not commensurate with the scope of the recited claims. None of the recited claims appears to require using a permeable transport web, which is intended to provide sufficient structural integrity; much less requires maintaining transverse orientation of reinforcing fibers when a resultant reinforcing structure is subjected to a pultrusion operation.

On page 14, Counsel argues that “*Smith does not disclose preparing a reinforcing structure by bonding a permeable transport web to transverse reinforcing fibers. The stitching and needling of Smith teach away from the method of Rau.*”. Examiner strongly disagrees with Counsel’s assertion that “*Smith does not disclose preparing a reinforcing structure by bonding a*

*permeable transport web to transverse reinforcing fibers.*". As clearly illustrated in figures 14-15, glass fiber bundles are deposited in-situ to form a randomly oriented web (expected to be gas permeable to a certain degree, since it is not impregnated/saturated with a resin) overlaying oriented-strand layers, thereafter, the web and the strand layer are needled and stitched together. As for Counsel's assertion that, "*The stitching and needling of Smith teach away from the method of Rau.*", Examiner strongly disagrees. As noted above, a reinforcement structure taught by Smith has a similar configuration as a reinforcement structure (i.e. fiber mat and transversely deposited layers of strands are needled together) taught by Rau. Since Smith teaches a "*reinforcement structure*" which has "*improved multidirectional strength characteristics*" and "*improved conformability and better resin absorption characteristics*", so that a resultant reinforced article has "*improved strength*" (col. 2 lines 3-15), one in the art would have been motivated to substitute a reinforcing structure taught by Rau with a reinforcing structure disclosed by Smith in forming a pultruded article.

On page 14, Counsel argues that, the "*randomly oriented fibers of Dana do not cure the lack of transverse fiber in Rau.*". As noted above, Examiner strongly disagrees with Counsel's characterization that Rau does not teach forming transversely oriented fibers. As for Counsel's argument that, "*Dana does not meet the limitation of the first reinforcing fibers comprising at least 40% of the volume of the materials comprising the reinforcing structure.*" Counsel appears to be resorting to a piecemeal analysis of the applied references. It is respectfully

submitted that, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

On page 15, Counsel argues that Smith does not anticipate or render the claimed invention, because “[t]here is no teaching or disclosure in Smith for preparing a reinforcing structure by bonding a permeable transport web to transversely oriented reinforcing fibers.”. Examiner strongly disagrees with Counsel’s assertion. As noted earlier, an air-laid fiber mat layer and oriented strands illustrated in figures 14-15 are taken to be the recited permeable transport web of staple fibers and the recited first reinforcing fibers, respectively. As for Counsel’s argument that, “*the claimed reinforcing structure provides longitudinal strength, sheer strength, and anti-skew resistance to allow the reinforcing mat to be carried through a pultrusion die.*”. It is respectfully submitted that, Counsel’s argument is not commensurate with the scope of the recited claims.

On page 15, Counsel argues that, “*neither references teaches preparing a reinforcing structure by bonding a permeable transport web to transversely oriented reinforcing fibers.*”. Examiner disagrees. As noted above, it would have been obvious in the art to replace an axially oriented reinforcing glass fiber strand layer taught by Beer et al with a multidirectional reinforcing glass strand such as the one taught by Vane for reasons set forth above. A resultant reinforcing

structure taught by the collective teachings of Beer et al in view of Vane comprises a fibrous web layer (14; expected to be gas permeable to a certain degree since it is not saturated with a resin) taught by Beer and a multi-directionally oriented reinforcing support layer (9) taught by Vane.

***Conclusion***

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sam Chuan C. Yao whose telephone number is (571) 272-1224. The examiner can normally be reached on Monday-Friday with second Friday off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Sam Chuan C. Yao  
Primary Examiner  
Art Unit 1733

Scy  
05-28-04